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COMMUNITY GUIDE REVIEW

Family-Based Interventions to Prevent Substance Use Among Youth: Community Guide Systematic Economic Review

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Introduction: This paper presents a systematic review of evidence from economic evaluations of family-based interventions that was recommended by the Community Preventive Services Task Force to prevent substance use among youth.

Methods: The search covered studies published from inception of databases through October 2023 and was limited to those based in the U.S. and other high-income countries. This review reports results from peer-reviewed studies and government reports as separate sources of evidence. Analyses were conducted in June 2023 through September 2024. Monetary values are in 2023 U.S. dollars.

Results: The search yielded 11 peer-reviewed studies and 2 government reports: 1 from the Washington State Institute for Public Policy that evaluated 14 programs and 1 from the Substance Abuse and Mental Health Administration that evaluated 8 programs. The median intervention cost ranged from $655 to $1,672 per family and $677 to $753 per youth or participant across the 3 sources of evidence. The median benefit to cost ratio were 5.8, 3.9, and 8.9 from peer-reviewed studies, Washington State Institute for Public Policy, and Substance Abuse and Mental Health Administration, respectively, with all 3 estimates indicating that benefits exceed cost. Substance Abuse and Mental Health Administration's report found some interventions to be cost saving and the others to have a median cost per quality-adjusted life years gained of $21,426.

Discussion: The Community Preventive Services Task Force determined that cost–benefit evidence across the 3 sources showed that societal benefits exceeded cost of family-based interventions to prevent substance use among youth. The Task Force determined that there were not enough studies to reach a conclusion about cost-effectiveness.

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INTRODUCTION

On the basis of most recent statistics, excessive drinking cost the U.S. about $249 billion in 2010 ($348 billion in 2023 dollars).[1] Costs for opioid use disorder and fatal opioid overdose in 2017 were estimated to be $1.02 trillion ($1.3 trillion in 2023 dollars), the majority of which was due to reduced quality of life and the value of life lost due to fatal overdose.[2] On the basis of the 2021 Global Burden of Diseases study, disability-adjusted life years lost due to drug use disorders in the U.S. was 6.5 million, which was 41.7% of the global total. More than 15% of this burden arose in the age group of 10−24 years, and about 17% arose in those aged 25−29 years.[3]

Youth substance use is associated with increased risk for behavioral and academic problems, teen pregnancy, sexually transmitted infections, perpetrating or experiencing violence, injuries, and mental health symptoms such as anxiety and depression.[4] Preventing or delaying substance use initiation among youth can reduce later risk for substance use, substance use disorders, and overdose.[4]

In 2023, substance use was common among U.S. high-school students and varied by categories of substance. Approximately one fourth of students (22%) reported currently drinking alcohol, 17% currently used marijuana, and 12% ever misused prescription opioids.[5] In 2023, almost 3 million middle- and high-school students reported currently using a commercial tobacco product,[6] and 8% of 8th graders reported past-year use of marijuana.[7]

Intervention research highlights parenting as a key protective factor against substance use that can be enhanced through skill-based training interventions.[4,8] Interventions designed to strengthen preventive skills and practices among parents and caregivers such as communication, positive relationship interactions, monitoring, and control have the potential to protect youth from substance use and other risk behaviors.[4,9]

The Community Preventive Services Task Force (CPSTF) recently recommended family-based interventions that provide instruction or training to parents and caregivers to enhance substance use preventive skills and practices for children and adolescents. The CPSTF is an independent, nonfederal panel of public health and prevention experts[10] that provides guidance on public health intervention approaches that work, on the basis of available scientific evidence.[11] The CPSTF recommendation was based on a systematic review that found that the family-based interventions were effective in preventing initiation and use among youth.[12,13] A separate systematic economic review of the interventions was conducted after the CPSTF recommendation. On the basis of the results from the systematic economic review, the CPSTF found that the societal economic benefits exceed the cost of these interventions.[12,13] This study describes the methods, results, and conclusions from the systematic economic review.

METHODS

This study was conducted using established methods for Community Guide systematic economic reviews developed by the Centers for Disease Control and Prevention (CDC) and approved by the CPSTF.[14,15] The study team included subject-matter experts on substance use from CDC's National Center for Injury Prevention and Control and various agencies, organizations, and academic institutions; members of the CPSTF; and experts in systematic economic reviews from the Community Guide Program at the CDC. Three reviewers (VJ, JR, and SKC) worked in pairs and independently screened the search yield and abstracted information from the included studies. Unresolved disagreements between reviewers were taken to the full review team for final adjudication.

Intervention Definition

Family-based interventions provide instruction or training to parents and caregivers to enhance substance use preventive skills and practices for children and adolescents. Interventions include individual or small group sessions, web-based modules, printed instruction manuals and workbooks, or a combination of formats. Content may address parent−child communication, rule setting, and monitoring. Interventions may be delivered or supported by health professionals or trained family providers in home, school, or community settings. Interventions may include additional substance use prevention activities for children and adolescents.

Research Questions

The study team developed an economic analytic framework identifying the intervention, population, and economic outcomes of interest (Figure 1). The framework also identified components of each economic outcome that are drivers—components that contribute substantially to the magnitude of estimates. The following research questions were addressed by the review:

- What is the cost to implement the intervention?
- What are the economic benefits of the intervention?
- Is the intervention cost-beneficial?
- Is the intervention cost-effective?

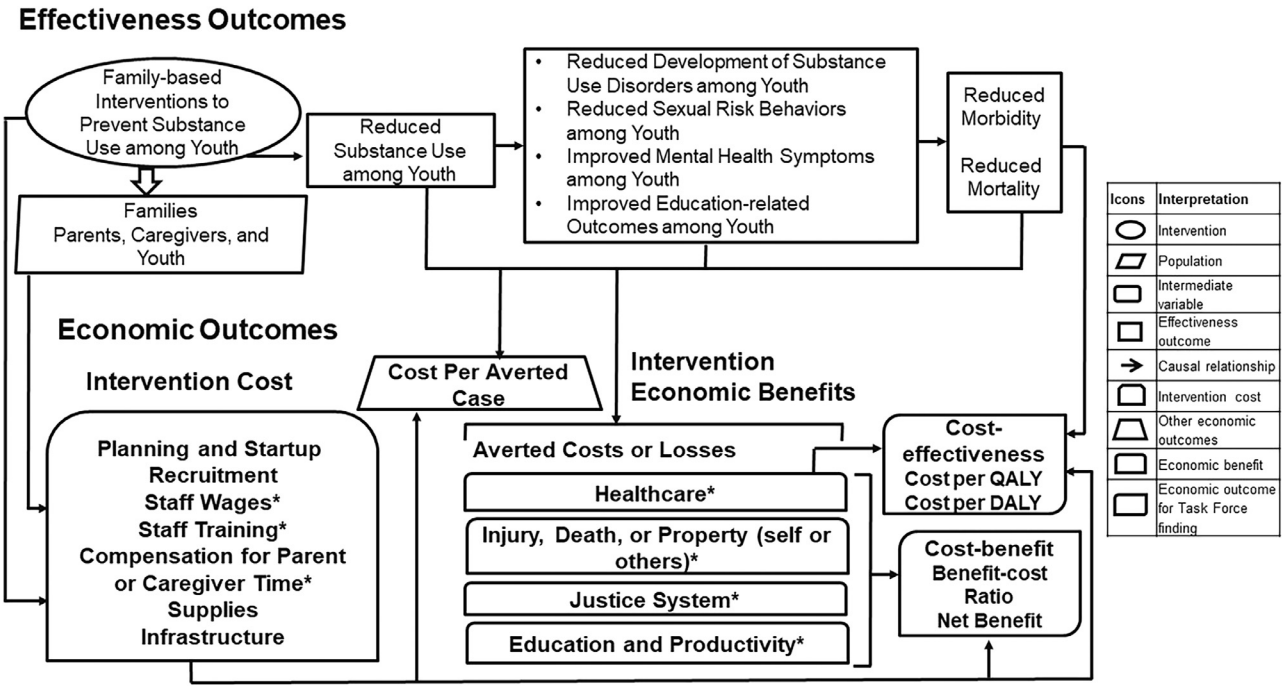

Figure 1. Analytic framework: Family-based interventions to prevent substance use among youth.
*Cost or benefit driver.
DALY, disability-adjusted life year; QALY, quality-adjusted life year.

The economic outcomes related to the research questions are defined below.

Intervention cost. Components considered drivers of magnitude of intervention cost were staff labor, staff training, and compensation for parent or caregiver time. Additional cost components considered were planning and startup, infrastructure, and recruitment.

Intervention benefits. Effective interventions that prevent substance use and other risk behaviors lead to economic benefits in terms of healthcare cost averted, averted costs of injuries and death, averted costs to the justice system, and averted losses in educational attainment and future productivity at worksites when youth enter the workforce. In addition to these components, deadweight loss due to taxation is often incorporated into cost–benefit analysis as a source of additional societal cost or negative benefit. Deadweight loss due to taxation is the reduction in private consumption and production when taxes are raised, such as to fund social programs. It is postulated that all the mentioned benefits are drivers of total benefit resulting from the intervention.

Cost–benefit. Cost–benefit is expressed as the ratio of economic benefits to intervention cost. Both benefits and cost are measured in monetary terms and are constituted from a societal perspective, where all costs and benefits are considered regardless of who pays and who benefits.

Life years lived. Averted substance use increase both quantity and quality of life years lived. Economic evaluations generally measure this outcome as quality-adjusted life years (QALYs) gained or disability-adjusted life years (DALYs) averted.

Cost-effectiveness. Cost-effectiveness is the net cost per QALY gained or the net cost per DALY averted. Net cost is intervention cost minus any averted healthcare cost. An intervention is considered cost effective when the net cost per QALY gained is ≤$50,000 or the net cost per DALY averted is less than or equal to per capita gross domestic product of the relevant country.

Quality Assessment of Evidence

Quality is assessed for each estimate reported by included studies. This quality assessment of estimates rather than of studies distinguishes Community Guide review methods. A quality assessment tool was specifically designed for this systematic review and is available in Appendix 1 (available online). Two raters used the tool to independently assign and later reconcile points, which indicate limitations in the quality of the estimates for intervention cost, intervention benefit, QALY, cost–benefit, and cost per QALY gained. Each estimate

was scored as good, fair, or limited in (1) quality of capture on the basis of inclusion of components deemed to be drivers of magnitude for the estimate and (2) quality of measurement on the basis of the appropriateness of analysis and methods used to derive the estimate. The final quality score for an estimate is the lower of the quality assessed for capture and measurement. The quality score assigned to an estimate that is a combination of other estimates, such as cost−benefit, is the lower of the quality scores assigned to intervention cost and intervention benefit estimates. Estimates that received a limited quality score were removed from further consideration.

CPSTF systematic economic review methods adopt a societal perspective for outcomes. Cost and benefit that accumulate over multiple years need to be discounted to present values, and sensitivity analysis should be conducted for modeled estimates. These expectations, among others, for the ideal conduct of economic evaluations were built into the tool for quality assessment of estimates.

All monetary values in the results and discussion sections are in 2023 U.S. dollars, adjusted for inflation using the Consumer Price Index from the Bureau of Labor Statistics[16] and converted from foreign currency denominations using consumption purchasing power parities from the World Bank.[17] Economic estimates were measured in different per capita terms by the studies and could not be standardized to a single metric. Therefore, estimates are reported in per-family or per-youth or -participant terms throughout this review. Summaries of estimates are reported as medians for continuous variables (along with interquartile intervals [IQIs] when there are ≥4 estimates) and as frequencies for categorical variables. All analyses were conducted using Microsoft Excel in June 2023 through September 2024.

Inclusion Criteria and Search Strategy

The search was conducted with the following inclusion criteria: met the definition of the intervention, included ≥1 economic outcomes described in the research questions, conducted in a high-income country per World Bank criterion,[18] and written in English. CPSTF reviews generally admit into evidence only studies conducted in other high-income countries because those countries face similar population health concerns and have levels of resources similar to those in the U.S., the mandated focus of the CPSTF. The search was conducted in Medline, CINAHL, Cochrane, EconLit, ERIC, and PsycINFO for papers published from database inception through October 2023. Reference lists in included studies were screened, and subject-matter experts were consulted for additional studies. The search strategies were complex, with numerous search terms tailored to each database. The detailed search strategy is available on The Community Guide website.[12] In summary, the strategy joined the following terms for population and intervention concepts with a Boolean or: adolescents, youth, family, parenting and substance abuse and misuse. Terms relating to economic concepts of cost, benefit, and cost-effectiveness were then joined with a Boolean or. Finally, the group of population and intervention terms were joined with a Boolean and with the group of economic terms.

RESULTS

Figure 2 shows the search yield for the economic review that resulted in 11 peer-reviewed studies[19–29] and 2 government reports, the first from the Washington State Institute for Public Policy (WSIPP) (Washington State Institute for Public Policy 2023)[30] and the second from the 2008 Substance Abuse and Mental Health Services Administration (SAMHSA).[31] Appendix Table B.1 (available online) shows that there were 23 unique programs or combinations of programs evaluated across the 3 sources but with substantial overlap. More information about the reports from WSIPP 2023 (Washington state focus) and SAMHSA (national focus), including objectives, methods, and economic outcomes reported, are in Appendix B (available online) and Appendix Table B.2 (available online).

This review considers the evaluations in peer-reviewed studies and the 2 government reports as separate sources of evidence because the reports did not undergo traditional peer review; the 2 reports used different methods in their economic evaluations; and WSIPP updated its evaluations on its website in December 2023, whereas the SAMHSA 2008 report has remained static.

Table 1[19–31] shows the various evaluated programs, beginning with peer-reviewed studies that evaluated 14 programs,[19–29] followed by WSIPP 2023 that evaluated 14 programs and SAMHSA 2008 that evaluated 8 programs. Some programs had components in addition to improving parent or caregiver skills to prevent youth substance use: 5 programs from peer-reviewed studies, 6 from WSIPP 2023, and 5 from SAMHSA 2008. The most frequent additional component was school-based substance use prevention curricula, whereas others added components such as referrals to community services, academic services for youth, and enhanced services for youth justice system encounters. All programs were based in the U.S., except for 1 study that was based in the United Kingdom.[28]

Table 1[19–31] also shows intervention and demographic characteristics. Among the peer-reviewed studies, the substance of focus for the interventions was most

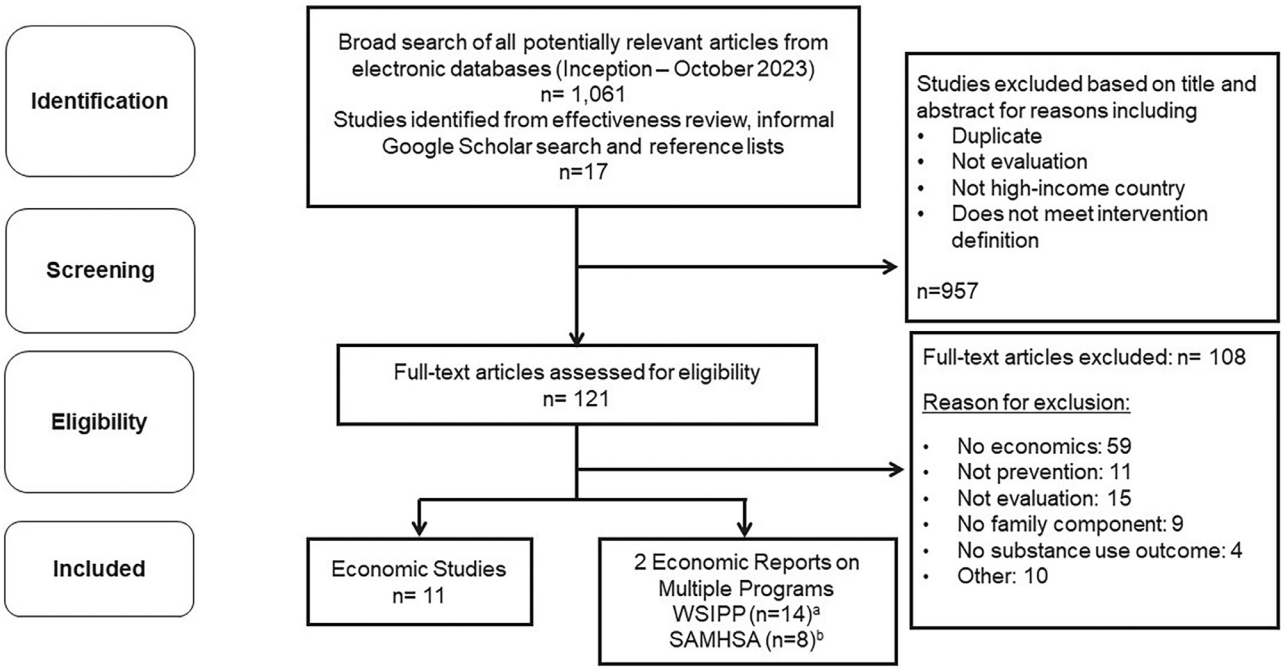

Figure 2. Search yield and included studies.
[a]https://www.wsipp.wa.gov/BenefitCost.
[b]https://www.samhsa.gov/sites/default/files/cost-benefits-prevention.pdf.

commonly alcohol,[19,20,23,25,26,29] followed by illicit substances,[24,25] tobacco,[19,20,26] and cannabis.[19,25] The studies that did not specify a substance[13,21,27] or indicated several substances[19,25,28] as part of their prevention efforts were construed to target substance use in general. The median number of 7.5 sessions occurred mostly as group meetings. The interventions were about equally divided among home, community, and school settings. In the peer-reviewed studies, 6 interventions were implemented in predominantly White,[22,24,29] 4 were in African American,[19,21,25] and 1 was in Latino populations.[27] Among the programs evaluated by WSIPP 2023,[30] the substances of focus were most frequently alcohol, followed by cannabis and tobacco. The median number of sessions was 9.0, mostly in groups and equally divided among home, community, and school settings. Programs evaluated by WSIPP 2023 included 2 tailored for African American and 1 for Latino families. Most of the programs evaluated in the peer-reviewed studies and WSIPP were between 1 and 3 months in duration, whereas others were 24 months or longer and extended over multiple school grades. Among the programs evaluated by SAMHSA 2008,[31] most focused on alcohol, followed by tobacco and cannabis. Other intervention and demographic information were very infrequently reported.

Table 2[19–31] shows that programs evaluated in peer-reviewed studies were in rural settings,[19,22,24,29] small towns,[26] or mixed urban–rural settings,[20] with a smaller number evaluated in large urban areas.[23,25,27] Note that the WSIPP 2023 and SAMHSA 2008 reports were evaluated from the standpoint of the Washington state and U.S., respectively. Sex of the parent or caregiver was infrequently reported, but both males and females were about equally represented among the youth.

Table 2[19–31] shows the estimates for intervention cost, intervention benefit, benefit-to-cost ratio, and cost-effectiveness for the evaluated programs. As in Table 1,[19–31] peer-reviewed studies are shown first, followed by evaluations from WSIPP 2023 and SAMHSA 2008. Among the peer-reviewed studies, 9 provided estimates for intervention cost (14 estimates),[19–26,29] 3 for intervention benefit (5 estimates),[22,24,26] 3 for cost–benefit (5 estimates),[24,26,29] and 1 for cost-effectiveness (1 estimate).[28] WSIPP 2023 provided 14 estimates each for intervention cost, intervention benefit, and cost–benefit. SAMHSA 2008 provided 8 estimates each for intervention cost, intervention benefit, cost–benefit, and cost-effectiveness.

Quality of Estimates

Table 2[19–31] also reports the quality of estimates. In the case of peer-reviewed studies, limitations were

Table 1. Intervention and Population Characteristics

Source Program name Study or report Country	Substance focus[a] Program components in addition to parenting skills[b]	Number of sessions (duration)[c] Group or one-on-one[d] Setting[e]	Population race or ethnicity[f] Parent sex percentage[g] School level[h], rural/urban[i]
Peer-reviewed studies Familias Unidas McCollister et al., 2014[27] U.S.	Unspecified substance None	19 (16 weeks) Group Home and school	Latino 100% Female NR Middle, urban
Peer-reviewed studies Family matters Bauman et al., 2001[20] U.S.	Alcohol, tobacco None	NR (8 weeks) One-on-one self-directed Home	National random sample Female NR Middle to high, mixed
Peer-reviewed studies Family empowerment intervention Dembo et al., 2002[23] U.S.	Alcohol Access and referrals to community resources	30 (10 weeks) One-on-one Home	White 56%, African American 41%, Latino 26%, other 3% Female NR High, urban
Peer-reviewed studies Guiding good choices Spoth et al., 2002[29] U.S.	Alcohol None	5 (5 weeks) Group Community and school	White 99% Female NR Middle, rural
Peer-reviewed studies Iowa Strengthening Families Program Spoth et al., 2002[29] U.S.	Alcohol None	7 (7 weeks) Group Community and school	White 99% Female NR Middle, rural
Peer-reviewed studies Protecting strong African American Families Barton et al., 2018[19] U.S.	Alcohol, cannabis, tobacco None	8 (6–8 weeks) One-on-one Home	African American 100% Female 94% Middle, Rural
Peer-reviewed studies Strong African American Families - Teen Corso et al., 2013[21] U.S.	Unspecified substance None	5 (5 weeks) Group Community	African American 100% Female NR High, rural
Peer-reviewed studies Communities that care Kuklinski et al., 2015[26] U.S.	Alcohol, tobacco Interventions chosen by community coalitions on the basis of need	NR (multiple grades) Group Community and school	White 64%, Latino 20%, African American 3%, other 7% Female NR Elementary to middle, small to midsize towns
Peer-reviewed studies Iowa Strengthening Families Program Guyll et al., 2011[24] U.S.	Illicit substance None	7 (7 weeks) Group Community and school	White 98%–99% Female NR Middle, rural
Peer-reviewed studies Staying connected with your teen - group	Alcohol, cannabis, illicit substance None	7 (7–10 weeks) Group Community	White 51%, African American 49% Female 80% Middle, urban

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Table 1. Intervention and Population Characteristics (*continued*)

Source Program name Study or report Country	Substance focus[a] Program components in addition to parenting skills[b]	Number of sessions (duration)[c] Group or one-on-one[d] Setting[e]	Population race or ethnicity[f] Parent sex percentage[g] School level[h], rural/urban[i]
Haggerty et al., 2015[25] U.S.			
Peer-reviewed studies Staying connected with your teen - self-managed Haggerty et al., 2015[25] U.S.	Alcohol, cannabis, illicit substance None	7 (7–10 weeks) One-on-one Home	White 51%, African American 49% Female 80% Middle, urban
Peer-reviewed studies Strengthening Families Program + All Stars Crowley et al., 2014[22] U.S.	Opioid Intervention for parents and students	20 (multiple grades) Group School	White 98% Female NR Middle, rural
Peer-reviewed studies Strengthening Families Program + life skills training Crowley et al., 2014[22] U.S.	Opioid School curricular intervention	22 (multiple grades) Group School	White 98% Female NR Middle, rural
Peer-reviewed studies Strengthening Families Program + life skills training Guyll et al., 2011[24] U.S.	Illicit substance School curricular intervention	22 (Multiple grades) Group Community and school	White 98%–99% Female NR Middle, rural
Peer-reviewed studies Strengthening Families Program Segrott et al., 2022[28] United Kingdom	Alcohol, cannabis, illicit substance, tobacco Social and health programs available to intervention and control	7 (7 weeks) Group NR	White 99.6% Female 22% Middle, mixed
WSIPP Family matters WSIPP, 2023[30] U.S.	Alcohol, tobacco None	NR (8 weeks) One-on-one Home	NR NR Middle to high, NR
WSIPP Guiding good choices WSIPP, 2023[30] U.S.	Alcohol, cannabis, illicit substance, tobacco None	5 (5 weeks) Group Community	NR NR Middle, NR
WSIPP Positive family support WSIPP, 2023[30] U.S.	Alcohol, cannabis, tobacco, unspecified substance School curricular intervention, counseling, referrals to social services	NR (6 weeks) One-on-one and group School	NR NR Middle, NR
WSIPP Strengthening African American Families	Alcohol None	7 (7 weeks) Group Community	African American 100% NR Middle, NR

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Table 1. Intervention and Population Characteristics (*continued*)

Source Program name Study or report Country	Substance focus[a] Program components in addition to parenting skills[b]	Number of sessions (duration)[c] Group or one-on-one[d] Setting[e]	Population race or ethnicity[f] Parent sex percentage[g] School level[h], rural/urban[i]
WSIPP, 2023[30] U.S.			
WSIPP Strengthening African American Families - Teen WSIPP, 2023[30] U.S.	Alcohol None	5 (5 weeks) Group Community	NR NR High, NR
WSIPP CASASTART WSIPP, 2023[30] U.S.	Alcohol, illicit substance Community policing, tutoring, special events, enhanced services for justice system encounters	NR (24 months) Group and one-on-one Community	NR NR Middle, NR
WSIPP Computer-based programs WSIPP, 2023[30] U.S.	Alcohol, cannabis, tobacco None	NR (NR) Digital Home and others	NR NR NR, NR
WSIPP Communities that care WSIPP, 2023[30] U.S.	Alcohol, cannabis, illicit substance, tobacco Interventions chosen by community coalitions on the basis of need	NR (Multiple grades) Group Community	NR NR Elementary to middle, NR
WSIPP Familias Unidas WSIPP, 2023[30] U.S.	Alcohol, cannabis, illicit substance, tobacco, unspecified substance None	12 (12 weeks) Group and one-on-one Home and School	Latino 100% NR Middle, NR
WSIPP New Beginnings WSIPP, 2023[30] U.S.	Alcohol, cannabis, illicit substance None	11 (10–11 weeks) Group and One-on-One Outpatient	NR NR Elementary to middle, NR
WSIPP Project Northland WSIPP, 2023[30] U.S.	Alcohol, cannabis, tobacco School curricular intervention	NR (multiple grades) Group and one-on-one Home and school	NR NR Middle, NR
WSIPP Project STAR WSIPP, 2023[30] U.S.	Alcohol, cannabis, illicit substance, tobacco School curricular intervention, mass media, community engagement	12 (24–26 months) Group Community and school	NR NR Elementary to middle, NR
WSIPP PROSPER	Alcohol, cannabis, illicit substance, tobacco		

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Table 1. Intervention and Population Characteristics (*continued*)

Source Program name Study or report Country	Substance focus[a] Program components in addition to parenting skills[b]	Number of sessions (duration)[c] Group or one-on-one[d] Setting[e]	Population race or ethnicity[f] Parent sex percentage[g] School level[h], rural/urban[i]
WSIPP, 2023[30] U.S.	School curricular and other interventions	17–31 (24 months) Group School	NR NR Middle, NR
WSIPP Strengthening Families Program WSIPP, 2023[30] U.S.	Alcohol, cannabis, illicit substance, tobacco, unspecified substance None	7 (7 weeks) Group School	NR NR Middle, NR
SAMHSA Family matters SAMHSA, 2008[31] U.S.	Alcohol, tobacco None	NR (NR) NR School	NR NR Middle to high, NR
SAMHSA Guiding good choices SAMHSA, 2008[31] U.S.	Alcohol, cannabis, illicit substance, tobacco None	NR (NR) NR Home, community, school	NR NR Middle, NR
SAMHSA Strengthening Families Program SAMHSA, 2008[31] U.S.	Alcohol, cannabis, illicit substance, tobacco, Unspecified substance None	NR (NR) NR Home, community, school	NR NR Middle, NR
SAMHSA CASASTART SAMHSA, 2008[31] U.S.	Alcohol, illicit substance Community policing, tutoring, special events, enhanced services for justice system encounters	NR (NR) NR Home, community, school	NR NR Elementary to middle, NR
SAMHSA Positive family support SAMHSA, 2008[31] U.S.	Alcohol, cannabis, tobacco, unspecified substance School curricular intervention, counseling, referrals to social services	NR (NR) NR Home, community, school	NR NR Middle, NR
SAMHSA Project Northland SAMHSA, 2008[31] U.S.	Alcohol, cannabis, tobacco School curricular intervention	NR (NR) NR School	NR NR Middle to high, NR
SAMHSA Project Star SAMHSA, 2008[31] U.S.	Alcohol, cannabis, illicit substance, tobacco School curricular intervention, mass media, community engagement	NR (NR) NR School	NR NR Middle to high, NR

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Table 1. Intervention and Population Characteristics (*continued*)

Source Program name Study or report Country	Substance focus[a] Program components in addition to parenting skills[b]	Number of sessions (duration)[c] Group or one-on-one[d] Setting[e]	Population race or ethnicity[f] Parent sex percentage[g] School level[h], rural/urban[i]
SAMHSA Stars for Families SAMHSA, 2008[31] U.S.	Alcohol Youth health consultation	NR (NR) NR School	NR NR Middle, NR

[a]Number of programs by substance focus: for peer-reviewed studies, alcohol, 9; cannabis, 4; illicit substance, 5; tobacco, 4; unspecified substance, 2. For programs from WSIPP 2023, alcohol, 14; cannabis, 10; illicit substance, 8; tobacco, 9; unspecified substance, 3. For programs from SAMHSA 2008, alcohol, 8; cannabis, 5; illicit substance, 3; tobacco, 6; and unspecified substance, 2.
[b]Number of programs with additional program component: peer-reviewed studies, 6; programs from WSIPP, 30; and programs from SAMHSA 2008. 5.
[c]Median number of sessions: peer-reviewed studies, 7.5 (IQI=7.0–20.5); programs from WSIPP 2023, 9.0 (6.5–12.0); and programs from SAMHSA 2008, not reported.
[d]Programs by mode of delivery: peer-reviewed studies, Group 11, one-on-one, 4; programs from WSIPP 2023, Group 10, one-on-one, 6; and programs from SAMHSA 2008, not reported.
[e]Programs by setting: for peer-reviewed studies, home 5, community 7, and school 7; for programs from WSIPP 2023, home 4, community 6, and school 6; and for programs from SAMHSA 2008, home 4, community 4, and school 8.
[f]Predominant race/ethnicity: for peer-reviewed studies, mostly White 6, mixed 4, African American 2, and Latino 1; for programs from WSIPP 2023, African American 2, Latino 1, and NR 11; and for programs from SAMHSA 2008, NR.
[g]Median female parent for peer-reviewed studies: WSIPP 2023 and SAMHSA 2008 do not collect this information report because they model for the State of Washington and U.S., respectively.
[h]Level of school of youth: for peer-reviewed studies, elementary to middle 1, middle 10, and middle to high 1; for programs from WSIPP 2023, elementary to middle 3, middle 7, middle to high 1, and high 1; and for programs from SAMHSA 2008, elementary to middle 1, middle 4, and middle to high 3.
[i]Urbanicity: for peer-reviewed studies, urban 5, rural or mixed 10; for programs from WSIPP 2023, NR; and for programs from SAMHSA 2008, NR.
IQI, interquartile interval; NR, not reported; SAMHSA, Substance Abuse and Mental Health Services Administration; WSIPP, Washington State Institute for Public Policy.

frequently assigned for poor reporting and not accounting for parent or caregiver time, averted injury or death, or uncertainty. In the case of WSIPP 2023, limitations were frequently assigned for not accounting for parent or caregiver time or for uncertainty in intervention cost estimates. In the case of SAMHSA 2008, the limitation points were for inadequate reporting and not accounting for parent or caregiver time, productivity benefits, or uncertainty.

Intervention Cost

Table 2[19–31] shows the estimates for intervention cost. For the peer-reviewed studies, median intervention cost per family was $1,672 (IQI=$1,279–$2,322) on the basis of 6 estimates from 5 studies,[19–21,23,29] and median cost per youth or participant was $753 (IQI=$569–$1,316) on the basis of 7 estimates from 4 studies.[22,24–26] In addition, 1 study[27] estimated the parent caregiver time for participation at $812 per family. Among these estimates, 9 were of good quality, and 5 were fair.

WSIPP 2023[30] reported median intervention cost per family of $655 (IQI=$241–$808) on the basis of 5 programs and median cost per youth or participant of $680 (IQI=$119–$888) on the basis of 9 programs. Among the WSIPP 2023 estimates, 6 were of good quality, and 8 were of fair quality. SAMHSA[31] reported mean intervention cost per family of $988 (minimum=$271, maximum=$1,490) on the basis of 3 programs and median intervention cost per youth or participant of $677 (IQI=$677–$2,032) on the basis of 5 programs. Among SAMHSA 2008 estimates, 2 were of good quality, and 6 were of fair quality.

Intervention Benefit

Table 2[19–31] also shows estimates for monetized total benefits along with the types of benefits that were monetized and summed over to produce the total. Note that peer-reviewed studies varied in the types of benefits included in the total.

Among the peer-reviewed studies, 2 estimated benefits as savings from potentially averted burden: savings of $147,412[24] per case of averted methamphetamine use from the perspective of an employer and savings of $11,336[22] per case of averted opioid misuse. One study[26] estimated $6,064 in benefits per youth in a cost–benefit analysis. All 3 estimates were of good quality.

WSIPP 2023[30] reported median intervention benefit per family of $2,211 (IQI=$2,022–$2,372) on the basis of 5 programs and median benefit per youth or participant of $2,510 (IQI=$366–$3,994) on the basis of 9 programs. All 14 benefit estimates from WSIPP 2023 were of good quality. SAMHSA 2008[31] reported mean intervention benefit per family of $9,767 (minimum=$4,234,

Table 2. Intervention Cost and Intervention Benefit

Source Program name Study or report Country	Intervention cost estimate[a]	Components of intervention[b] Cost quality of estimate[c]	Intervention benefit estimate[d]	Components of intervention benefit[e] Quality of estimate[f]	Benefit to cost ratio estimate[g] Quality[h] Uncertainty	Cost per QALY gained estimate[i] Quality[j] Uncertainty
Peer-reviewed studies Familias Unidas McCollister et al., 2014[27] U.S.	$812 per family	Parent time Fair	NR	NA	NR	NR
Peer-reviewed studies Family matters Bauman et al., 2001[20] U.S.	$262 per family	Wages, training Fair	NR	NA	NR	NR
Peer-reviewed studies Family empowerment intervention Dembo et al., 2002[23] U.S.	$2,654 per family	NR Fair	NR	NA	NR	NR
Peer-reviewed studies Guiding good choices Spoth et al., 2002[29] U.S.	$1,207 per family	Wages, training, parent time Good	$259,818 lifetime cost per case of alcohol disorder averted	Health care, labor, criminal justice, mortality, injury Good	5.8 Good Range (2.32–8.01)[k]	NR
Peer-reviewed studies Iowa Strengthening Families Program Spoth et al., 2002[29] U.S.	$1,495 per family	Wages, training, parent time Good	$259,818 lifetime cost per case of alcohol disorder averted	Health care, labor, criminal justice, mortality, injury Good	9.6 Good Range (3.81–12.07)[k]	NR
Peer-reviewed studies Protecting strong African American families Barton et al., 2018[19] U.S.	$2,480 per family	Wages, training, parent time Good	NR	NA	NR	NR
Peer-reviewed studies Strong African American Families - Teen Corso et al., 2013[21] 2013 U.S.	$1,849 per family	Wages, training, parent time Good	NR	NA	NR	NR
Peer-reviewed studies Communities that care Kuklinski et al., 2015[26] U.S.	$753 per youth	Wages, training, parent time Good	$6,064 per youth	Health care, labor, criminal justice Good	8.1 Good 95% CI=8.08, 8.36)	NR
Peer-reviewed studies Iowa Strengthening Families Program	$1,496 per youth	Wages, training, parent time Good	$147,412 per case of averted methamphetamine use	Health care, labor, criminal justice Good	3.8 Good Not cost beneficial	NR

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Table 2. Intervention Cost and Intervention Benefit (*continued*)

Source Program name Study or report Country	Intervention cost estimate[a]	Components of intervention[b] Cost quality of estimate[c]	Intervention benefit estimate[d]	Components of intervention benefit[e] Quality of estimate[f]	Benefit to cost ratio estimate[g] Quality[h] Uncertainty	Cost per QALY gained estimate[i] Quality[j] Uncertainty
Guyll et al., 2011[24] U.S.					when effect=0 when year >5	
Peer-reviewed studies Staying connected with your teen - group Haggerty et al., 2015[25] U.S.	$1,136 per participant	NR Fair	NR	NA	NR	NR
Peer-reviewed studies Staying connected with your teen - self-managed Haggerty et al., 2015[25] U.S.	$396 per participant	NR Fair	NR	NA	NR	NR
Peer-reviewed studies Strengthening Families Program + all stars Crowley et al., 2014[22] U.S.	$612 per participant	Wages, training, parent time Good	$11,336 per case of averted opioid misuse	Health care, labor, criminal justice, mortality Good	NR	NR
Peer-reviewed studies Strengthening Families Program + life skills training Crowley et al., 2014[22] U.S.	$526 per participant	Wages, training, parent time Good	$11,336 per case of averted opioid misuse	Health care, labor, criminal justice, mortality Good	NR	NR
Peer-reviewed studies Strengthening Families Program + life skills training Guyll et al., 2011[24] U.S.	$1,687 per youth	Wages, training, parent time Good	$147,412 per case of averted methamphetamine use	Health care, labor, criminal justice Good	1.6 Good Not cost beneficial when effect=0 when year >20	NR
Peer-reviewed studies Strengthening Families Program Segrott et al., 2022[28] United Kingdom	NR	NA	NR	NA	NR	Dominated[l] Fair NR
WSIPP Family matters WSIPP, 2023[30] U.S.	$241 per family	Wages, training Fair	$2,211 per family	Health care, labor, criminal justice, mortality, property loss, deadweight Loss Good	9.2 Fair 73%[m]	NR
WSIPP Guiding good choices WSIPP, 2023[30] U.S.	$808 per family	Wages, training, parent time Good	$1,095 per family	Health care, labor, criminal justice, mortality, property loss, deadweight Loss Good	1.4 Good 51%[m]	NR

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Table 2. Intervention Cost and Intervention Benefit (*continued*)

Source Program name Study or report Country	Intervention cost estimate[a]	Components of intervention[b] Cost quality of estimate[c]	Intervention benefit estimate[d]	Components of intervention benefit[e] Quality of estimate[f]	Benefit to cost ratio estimate[g] Quality[h] Uncertainty	Cost per QALY gained estimate[i] Quality[j] Uncertainty
WSIPP Positive family support WSIPP, 2023[30] U.S.	$53 per family	Wages, training Fair	$12,130 per family	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	227.2 Fair 71%[m]	NR
WSIPP Strong African American Families WSIPP, 2023[30] U.S.	$885 per family	Wages, training Fair	$2,022 per family	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	2.3 Fair 56%[m]	NR
WSIPP Strong African American Families - Teen WSIPP, 2023[30] U.S.	$655 per family	Wages, training Fair	$2,372 per family	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	3.6 Fair 59%[m]	NR
WSIPP CASASTART WSIPP, 2023[30] U.S.	$15,376 per participant	Wages, training, parent time Good	−$5,117 per youth	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	-0.3 Good 9%[m]	NR
WSIPP Computer-based programs WSIPP, 2023[30] U.S.	$87 per participant	NR Fair	$2,510 per youth	Health care, labor, criminal justice, mortality, property loss, deadweight Loss Good	28.8 Fair 64%[m]	NR
WSIPP Communities that care WSIPP, 2023[30] U.S.	$727 per participant	Wages, training, parent time Good	$4,129 per youth	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	5.7 Good 87%[m]	NR
WSIPP Familias Unidas WSIPP, 2023[30] U.S.	$1,828 per participant	Wages, training Fair	$7,618 per participant	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	4.2 Fair 69%[m]	NR
WSIPP New Beginnings WSIPP, 2023[30] U.S.	$888 per participant	Wages, training, parent time Good	−$399 per participant	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	-0.4 Good 49%[m]	NR
WSIPP Project Northland WSIPP, 2023[30] U.S.	$119 per participant	Wages, training Fair	$383 per youth	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	3.2 Fair 56%[m]	NR

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Table 2. Intervention Cost and Intervention Benefit (*continued*)

Source Program name Study or report Country	Intervention cost estimate[a]	Components of intervention[b] Cost quality of estimate[c]	Intervention benefit estimate[d]	Components of intervention benefit[e] Quality of estimate[f]	Benefit to cost ratio estimate[g] Quality[h] Uncertainty	Cost per QALY gained estimate[i] Quality[j] Uncertainty
WSIPP Project STAR WSIPP, 2023[30] U.S.	$77 per participant	Wages, training Fair	$3,192 per youth	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	41.3 Fair 72%[m]	NR
WSIPP PROSPER WSIPP, 2023[30] U.S.	$419 per participant	Wages, training, parent time Good	$366 per participant	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	0.9 Good 44%[m]	NR
WSIPP Strengthening Families Program WSIPP, 2023[30] U.S.	$680 per participant	Wages, training, parent time Good	$3,994 per participant	Health care, labor, criminal justice, mortality, property loss, deadweight loss Good	5.9 Good 60%[m]	NR
SAMHSA Family matters SAMHSA, 2008[31] U.S.	$271 per family	Wages, training Fair	$8,130 per family	Health care, labor, criminal justice, mortality, quality of life Good	30.0 Fair NR	Cost saving Fair NR
SAMHSA Guiding good choices SAMHSA, 2008[31] U.S.	$1,203 per family	Wages, training, parent time Good	$4,234 per family	Health care, labor, criminal justice, mortality, quality of life Good	3.4 Good NR	$25,406 Good NR
SAMHSA Strengthening Families Program SAMHSA, 2008[31] U.S.	$1,490 per family	Wages, training, parent time Good	$16,937 per family	Health care, labor, criminal justice, mortality, quality of life Good	11.0 Good NR	Cost saving Good NR
SAMHSA CASASTART SAMHSA, 2008[31] U.S.	$9,570 per youth	Wages, training Fair	$8,299 per youth	Health care, labor, criminal justice, mortality, quality of life Good	0.9 Fair NR	$293,015 Fair NR
SAMHSA Positive family support SAMHSA, 2008[31] U.S.	$2,032 per youth	Wages, training Fair	$16,090 per youth	Health care, labor, criminal justice, mortality, quality of life Good	7.8 Fair NR	$17,445 Fair NR
SAMHSA Project Northland SAMHSA, 2008[31] U.S.	$677 per youth	Wages, training Fair	$11,687 per youth	Health care, labor, criminal justice, mortality, quality of life Good	17.0 Fair NR	Cost saving Fair NR

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Table 2. Intervention Cost and Intervention Benefit (*continued*)

Source Program name Study or report Country	Intervention cost estimate[a]	Components of intervention[b] Cost quality of estimate[c]	Intervention benefit estimate[d]	Components of intervention benefit[e] Quality of estimate[f]	Benefit to cost ratio estimate[g] Quality[h] Uncertainty	Cost per QALY gained estimate[i] Quality[j] Uncertainty
SAMHSA Project Star SAMHSA, 2008[31] U.S.	$677 per youth	Wages, training Fair	$6,944 per youth	Health care, labor, criminal justice, mortality, quality of life Good	10.0 Fair NR	$3,896 Fair NR
SAMHSA Stars for families SAMHSA, 2008[31] U.S.	$203 per youth	Wages, training Fair	$830 per youth	Health care, labor, criminal justice, mortality, quality of life Good	4.0 Fair NR	Cost saving Fair NR

[a]Median intervention cost: for peer-reviewed studies, cost per family, $1,672 (IQI=$1,279–$2,322), cost per youth or participant, $753 (IQI=$569–$1,316); for programs from WSIPP 2023, cost per family, $655 (IQI=$241–$808), cost per youth or participant, $680 (IQI=$119–$888; and programs from SAMHSA 2008, cost per family, mean $988 (minimum $271, maximum $1,490) and cost per youth or participant, $677 (IQI=$677–$2,032).
[b]Intervention cost components: for peer-reviewed studies, wages 10, training 10, and parent time 10; for programs from WSIPP 2023, wages 13, training 13, parent time 6; and for programs from SAMHSA 2008, wages 8, training 8, and parent time 2.
[c]Intervention cost quality of estimate: for peer-reviewed studies, good 9, fair 5; for programs from WSIPP 2023, good 6, fair 8; and for programs from SAMHSA 2008, good 2, fair 6.
[d]Median intervention benefit: for peer-reviewed studies, cannot summarize; for programs from WSIPP 2023, benefit per family: $2,211 (IQI=$2,022 to $2,372), benefit per youth or participant, $2,510 (IQI=$366 to $3,994); for programs from SAMHSA 2008, benefit per family: mean $9,767 (minimum $4,234, maximum $16,937), for benefit per youth or participant: $8,299 (IQI=$6,944 to $11,687).
[e]Components of benefit: for peer-reviewed studies, healthcare 7, labor 7, criminal justice 7, mortality 4, injury 2; for programs from WSIPP 2023, health care 14, labor 14, criminal justice 14, mortality 14, property loss 14, deadweight loss 14; and for programs from SAMHSA 2008: health care 8, labor 8, criminal Justice 8, mortality 8, and quality of life 8.
[f]Quality of benefit estimate: for peer-reviewed studies, good 7, fair 0; for programs from WSIPP 2023, good 14, fair 0; and for programs from SAMHSA 2008, good 8, fair 0
[g]Median benefit to cost ratio: for peer-reviewed studies, 5.8 (IQI=3.8–8.1); for programs from WSIPP 2023: 3.9 (IQI=1.6, 8.4); and for programs from SAMHSA 2008, 8.9 (IQI=3.9–12.5).
[h]Quality of benefit-to-cost ratio estimates: for peer-reviewed studies, good 5, fair 0; for programs from WSIPP 2023, good 6, fair 8; and for programs from SAMHSA 2008, good 2, fair 6.
[i]Median cost-effectiveness, for peer-reviewed studies, NA; for programs from WSIPP 2023, NA; and for programs from SAMHSA 2008, $21,426 (IQI=$14,058–$92,308) and cost saving 4.
[j]Quality of cost-effectiveness estimates: for peer-reviewed studies, fair 1; for programs from WSIPP 2023, NA; and for programs from SAMHSA 2008, good 2, fair 6.
[k]Minimum and maximum under 1-way sensitivity analyses.
[l]Reduced QALY at higher cost.
[m]Percentage of times when benefit-to-cost ratio >1.0, where model simulated 10,000 times with random selection of input values.
IQI, interquartile interval; NA, not applicable; NR, not reported; SAMHSA, Substance Abuse and Mental Health Services Administration; WSIPP, Washington State Institute for Public Policy.

maximum=$16,937) on the basis of 3 programs and median intervention benefit per youth or participant of $8,299 (IQI=$6,944−$11,687) on the basis of 5 programs. All estimates from SAMHSA 2008 were of good quality. The value of components of intervention benefit for programs evaluated by WSIPP 2023 and SAMHSA are shown in Appendix Table B.3 (available online).

Cost-effectiveness

Table 2[19−31] shows that 1 peer-reviewed study[28] found the intervention to be ineffective and hence not cost effective, and this estimate was of good quality. SAMHSA[31] evaluated the cost-effectiveness of 8 programs, finding 4 to be cost saving, with the remaining 4 programs producing a median cost per QALY gained of $21,426 (IQI=$14,058−$92,308). Note that 1 program was reported with $293,015 per QALY gained. Among the SAMHSA 2008 estimates, 2 were of good quality, and 4 were of fair quality. SAMHSA 2008 did not report uncertainty. WSIPP 2023[30] did not conduct cost-effectiveness analysis.

Cost–Benefit

Table 2[19−31] presents cost−benefit results along with uncertainty of the estimates. The median cost−benefit ratio from peer-reviewed studies was 5.8 (IQI=3.8−8.1) on the basis of 4 estimates from 3 studies.[24,26,29] All 4 estimates from peer-reviewed studies were of good quality. Different measures of uncertainty were presented; one[29] found that the minimum and maximum cost−benefit ratios were >1.0 in 1-way sensitivity analyses, whereas another[26] noted that the intervention was cost beneficial with 95% significance. The third study[24] found that the intervention would not be cost beneficial if the modeled intervention effectiveness became zero in Year 5.

WSIPP 2023[30] reported median cost−benefit ratio 3.9 (IQI=1.6−8.4) on the basis of estimates for 14 programs, with 6 being of good and 8 being of fair quality. Uncertainty of each estimate was reported as percentage of simulations where the cost−benefit ratio was >1.0. The median probability of a positive cost−benefit ratio across the 14 programs was 59.5% (IQI=52.3−70.5), with 3 programs showing a probability <50%. There were 2 programs that produced a negative total benefit under WSIPP's analysis: CASASTART due to a large deadweight loss from taxation and New Beginnings due to a large reduction in labor market earnings possibly from poor education outcomes. In addition, the benefits from the PROSPER program was estimated to fall just shy of the cost to deliver. Details can be seen in Appendix Table B.3 (available online).

SAMHSA 2008[31] reported median cost−benefit ratio of 8.9 (IQI=3.9−12.5) on the basis of estimates from 8 programs, with 2 being of good and 6 being of fair quality. Uncertainty of estimates was not reported. The overall conclusion is that the programs are cost beneficial on the basis of the observation that the first quartile of the distributions of estimates from all 3 sources were >1.0.

DISCUSSION

The economic evidence showed that the societal benefits of family-based interventions to prevent substance use among youth exceed the societal cost to implement the interventions in the U.S. The evidence was drawn from peer-reviewed studies and 2 government reports from the U.S. The conclusion of favorable cost−benefit was judged to be consistent within and across the sources of evidence. The CPSTF did not issue a statement on cost-effectiveness given that there was only 1 study from the peer-reviewed literature and that the evaluations from the 2008 SAMHSA report were judged to be dated for this purpose.[31]

Societal cost−benefit sums costs over implementers and benefits over beneficiaries who can be from different sectors and jurisdictions. On the cost side, the interventions covered in this review included those where health professionals provided parenting skills training and school systems delivered substance use prevention curricula. On the benefits side, averted costs due to substance use prevention accrued to the healthcare system and judicial systems and youth benefitted through productivity gains as working adults.

WSIPP 2023 produced negative cost−benefit estimates for 2 programs: CASASTART and New Beginnings. In addition, WSIPP 2023 found that the PROSPER program produced benefits just short of cost neutrality (cost−benefit=0.9). The intervention cost for the CASASTART program was likely high because it was developed as a comprehensive program for high-risk youth and involved healthcare, justice, and social services systems in its delivery. The WSIPP 2023 cost−benefit model for New Beginnings produced positive benefits only in healthcare cost averted and negative benefits (i.e., net cost increases) in other sectors. A substantial part of the cost of the PROSPER program was the monitoring and technical assistance provided by academic researchers.

The benefit-to-cost ratios reported by SAMHSA 2008 were consistently higher than those reported by WSIPP 2023. Only the SAMHSA report included a monetary valuation of reduced quality of life due to adolescent substance use; this increased estimated total benefits.[32] However, only WSIPP 2023 estimated the value of deadweight loss due to taxation in cost−benefit analysis, assuming it to equal 50% of intervention cost for each

evaluated program. None of the peer-reviewed studies or SAMHSA 2008 accounted for deadweight loss of taxation to fund the programs, which may be considered an omission resulting in their overestimation of benefit-to-cost ratios.

Cost per QALY gained was reported by SAMHSA 2008 and in 1 peer-reviewed study. SAMHSA 2008 reported a cost per QALY gained of $293,000 for the CASASTART program. This intervention was a comprehensive one-on-one intervention involving healthcare, justice, and social services systems that may have contributed to its large intervention cost. One peer-reviewed study[28] found that the intervention itself was not effective and hence not cost effective. The comparison and intervention groups in this study received substantial services from the healthcare system and other family assistance programs within the United Kingdom, and this may have dampened intervention effectiveness. The authors also noted that the study had implementation challenges because the intervention was universal, whereas the usual practice of agencies charged with implementation was to target services to those in greater need.

The review followed a $50,000 per QALY gained benchmark for cost-effectiveness. This is a very conservative benchmark, given that it was first introduced some decades ago and persists in the literature without adjustment for inflation or economic growth.[15,33]

Many estimates of intervention cost did not include the cost of parent or caregiver time spent participating in the interventions. The opportunity cost of parent or caregiver time for participation in the Familias Unidas program in 2009 was estimated at $812 per family in 2023 U.S. dollars,[27] a non-negligible cost that needs to be accounted. Table 2[19–31] identifies programs where intervention cost did not include parent or caregiver time. A cursory examination shows that intervention cost would exceed intervention benefit in the case of Project Northland reported by WSIPP 2023 and Stars for Families reported by SAMHSA 2008 once parent or caregiver time is added to cost. CASASTART as reported by SAMHSA 2008 would remain not cost beneficial. In summary, the overall cost–beneficial conclusion is not controverted even when the full $812 cost of parent or caregiver time is added to intervention cost of these programs because the first quartile of cost–benefit ratios would still be ≥1.0.

Some family-based programs were enhanced with school-based substance use prevention curricula. Although they would add to total cost, the additional school curricula would also increase benefits and thus maintain a favorable benefit-to-cost ratio.

The review of economic evidence identified some gaps in the research. There is need for cost-effectiveness evaluations based on more recent data. There is a dearth of economic evaluations for Latino, Asian, and American Indian and Native Alaskan populations as well as populations in large urban areas, also noted for American Indian and Native Alaskan populations in the review of effectiveness.[13] This research gap handicaps efforts to tailor programs to varied needs, demographics, and cultural contexts.

Limitations

There were substantial differences across the programs considered in this systematic review in terms of intervention components, targeted population, and the types of costs and benefits considered. Summary statistics of means, medians, and IQIs were drawn across these heterogeneous programs. This contributed to the often-wide IQIs. However, the CPSTF considered whether the first quartile of benefit-to-cost ratio was >1.0 and the third quartile of cost-effectiveness <$50,000 when judging the economic merits of the intervention.

This review reported uncertainty only for the cost–benefit estimates from WSIPP 2023, although they separately evaluated uncertainty of model inputs and the outcomes of cost, benefit, and cost–benefit. SAMHSA 2008 did not report uncertainty.

CONCLUSIONS

This systematic economic review found that the societal economic benefits of family-based interventions to prevent substance use among youth exceeded the cost to implement these interventions.

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SUPPLEMENTAL MATERIAL

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REFERENCES

1. Data on excessive alcohol use: the cost of excessive drinking in the United States. Centers for Disease Control and Prevention. https://www.cdc.gov/alcohol/excessive-drinking-data/index.html. Updated August 6, 2024. Accessed January 5, 2025.
2. Florence C, Luo F, Rice K. The economic burden of opioid use disorder and fatal opioid overdose in the United States, 2017. *Drug Alcohol Depend.* 2021;218:108350. https://doi.org/10.1016/j.drugalcdep.2020.108350.
3. Zhang T, Sun L, Yin X, Chen H, Yang L, Yang X. Burden of drug use disorders in the United States from 1990 to 2021 and its projection until 2035: results from the GBD study. *BMC Public Health.* 2024;24(1):1639. https://doi.org/10.1186/s12889-024-19142-0.
4. HHS. Office of the Surgeon General. Facing Addiction in America: the Surgeon General's Report on Alcohol, Drugs, and Health. Washington, DC: HHS; 2016. https://www.hhs.gov/sites/default/files/facing-addiction-in-america-surgeon-generals-report.pdf. PublishedAccessed November 12, 2024.
5. Centers for Disease Control and Prevention. Youth Risk Behavior Survey Data Summary & Trends Report 2013-2023. Atlanta, GA: HHS, Centers for Disease Control and Prevention; 2024. https://www.cdc.gov/yrbs/dstr/index.html. Accessed: January 11, 2025.
6. Birdsey J, CM Cornelius M, Jamal A, et al. Tobacco product use among U.S. middle and high school students—national Youth Tobacco Survey, 2023. *MMWR Morb Mortal Wkly Rep.* 2023;72(44):1173–1182. https://doi.org/10.15585/mmwr.mm7244a1.
7. Miech RA, Johnston LD, Patrick ME, O'Malley PM, Bachman JG. *Monitoring the Future: National Survey Results on Drug Use, 1975-2023: overview and detailed results for secondary school students*. Ann Arbor, MI: Institute for Social Research, University of Michigan; 2024. https://monitoringthefuture.org/wp-content/uploads/2024/01/mtfoverview2024.pdf. Accessed January 14, 2025.
8. Ladis BA, Macgowan M, Thomlison B, et al. Parent-focused preventive interventions for youth substance use and problem behaviors: a systematic review. *Res Soc Work Pract.* 2019;29(4):420–442. https://doi.org/10.1177/1049731517753686.
9. Stockings E, Hall WD, Lynskey M, et al. Prevention, early intervention, harm reduction, and treatment of substance use in young people. *Lancet Psychiatry.* 2016;3(3):280–296. https://doi.org/10.1016/S2215-0366(16)00002-X.
10. About the community Preventive Services Task Force. Community Preventive Services Task Force. https://www.thecommunityguide.org/pages/about-community-preventive-services-task-force.html. Updated February 12, 2025. Accessed March 25, 2025.
11. The community guide. Community Preventive Services Task Force. https://www.thecommunityguide.org. Accessed March 25, 2025.
12. Substance use: family-based interventions to prevent substance use among youth. Community Preventive Services Task Force. https://www.thecommunityguide.org/findings/substance-use-family-based-interventions-to-prevent-substance-use-among-youth.html. Updated February 20, 2025. Accessed September 10, 2024.
13. Community Preventive Services Task Force (CPSTF). Substance use: family-based interventions to prevent substance use among youth. Atlanta, GA: Community Preventive Services Task Force (CPSTF), 2023. https://doi.org/10.15620/cdc/168597.
14. Methods manual for community Guide systematic reviews. Community Preventive Services Task Force. https://www.thecommunityguide.org/pages/methods-manual.html. Updated March 5, 2025. Accessed May 7, 2025.
15. Chattopadhyay SK, Jacob V, Hopkins DP, et al. Community Guide methods for systematic reviews of economic evidence. *Am J Prev Med.* 2023;64(4):569–578. https://doi.org/10.1016/j.amepre.2022.10.015.
16. Databases, tables & calculators by subject: CPI for all urban consumers (CPI-U). Bureau of Labor Statistics. https://data.bls.gov/timeseries/CUUR0000SA0?output_view=pct_1mth. Accessed June 15, 2024.
17. Purchasing power parities. PPP conversion factor, private consumption. The World Bank. https://data.worldbank.org/indicator/PA.NUS.PRVT.PP. Accessed June 15, 2024.
18. World Bank country and lending groups. The World Bank. https://datahelpdesk.worldbank.org/knowledgebase/articles/906519#High_-income. Accessed June 15, 2024.
19. Barton AW, Beach SRH, Wells AC, et al. The protecting strong African American families program: a randomized controlled trial with rural African American couples. *Prev Sci.* 2018;19(7):904–913. https://doi.org/10.1007/s11121-018-0895-4.
20. Bauman KE, Foshee VA, Ennett ST, Hicks K, Pemberton M. Family Matters: A family-directed program designed to prevent adolescent tobacco and alcohol use. *Health Promot Pract.* 2001;2(1):81–96. https://doi.org/10.1177/152483990100200112.
21. Corso PS, Ingels JB, Kogan SM, Foster EM, Chen YF, Brody GH. Economic analysis of a multi-site prevention program: assessment of program costs and characterizing site-level variability. *Prev Sci.* 2013;14(5):447–456. https://doi.org/10.1007/s11121-012-0316-z.
22. Crowley DM, Jones DE, Coffman DL, Greenberg MT. Can we build an efficient response to the prescription drug abuse epidemic? Assessing the cost effectiveness of universal prevention in the PROSPER trial. *Prev Med.* 2014;62:71–77. https://doi.org/10.1016/j.ypmed.2014.01.029.
23. Dembo R, Wothke W, Livingston S, Schmeidler J. The impact of a family empowerment intervention on juvenile offender heavy drinking: a latent growth model analysis. *Subst Use Misuse.* 2002;37(11):1359–1390. https://doi.org/10.1081/JA-120014082.
24. Guyll M, Spoth R, Crowley DM. Economic analysis of methamphetamine prevention effects and employer costs. *J Stud Alcohol Drugs.* 2011;72(4):577–585. https://doi.org/10.15288/jsad.2011.72.577.
25. Haggerty KP, Skinner ML, Catalano RF, Abbott RD, Crutchfield RD. Long-term effects of staying connected with your teen® on drug use frequency at age 20. *Prev Sci.* 2015;16(4):538–549. https://doi.org/10.1007/s11121-014-0525-8.
26. Kuklinski MR, Fagan AA, Hawkins JD, Briney JS, Catalano RF. Benefit-cost analysis of a randomized evaluation of communities that care:

monetizing intervention effects on the initiation of delinquency and substance use through Grade 12. *J Exp Criminol.* 2015;11(2):165–192. https://doi.org/10.1007/s11292-014-9226-3.

27. McCollister KE, Freitas DM, Prado G, Pantin H. Opportunity costs and financial incentives for Hispanic youth participating in a family-based HIV and substance use preventive intervention. *J Prim Prev.* 2014;35(1):13–20. https://doi.org/10.1007/s10935-013-0330-3.
28. Segrott J, Gillespie D, Lau M, et al. Effectiveness of the Strengthening Families Programme in the UK at preventing substance misuse in 10−14 year-olds: a pragmatic randomised controlled trial. *BMJ Open.* 2022;12(2):e049647. https://doi.org/10.1136/bmjopen-2021-049647.
29. Spoth RL, Guyll M, Day SX. Universal family-focused interventions in alcohol-use disorder prevention: cost-effectiveness and cost-benefit analyses of two interventions. *J Stud Alcohol.* 2002;63(2):219–228. https://doi.org/10.15288/jsa.2002.63.219.
30. Various report on cost-benefit from the Washington State Institute for Public Policy. Washington State Institute for Public Policy. www.wsipp.wa.gov/BenefitCost. Updated December 2024. Accessed April 10, 2024.
31. Miller T, Hendrie D. *Substance abuse prevention dollars and cents: A cost-benefit analysis, DHHS pub. No- 07-4298.* Rockville, MD: Center for Substance AbusePrevention, Substance Abuse and Mental Health Services Administration; 2008. https://www.samhsa.gov/sites/default/files/cost-benefits-prevention.pdf. Accessed January 23, 2024.
32. Office of the Assistant Secretary for Planning and Evaluation. Guidelines for regulatory impact analysis. Washington, DC: HHS; 2016. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//171981/HHS_RIAGuidance.pdf. Accessed September 22, 2024.
33. Neumann PJ, Cohen JT, Weinstein MC. Updating cost-effectiveness—the curious resilience of the $50,000-per-QALY threshold. *N Engl J Med.* 2014;371(9):796–797. https://doi.org/10.1056/NEJMp1405158.